Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of the Commission's	)	WT Docket No. 06-49
Part 90 Rules in the 904-909.75 and	)	
919.75-928 MHz Bands	)	

COMMENTS OF ITRON, INC.

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COMMENTS OF ITRON, INC.

Itron, Inc. ("Itron") hereby comments on the Notice of Proposed Rulemaking ("NPRM") in the above-captioned proceeding.[1]

I. INTRODUCTION AND SUMMARY

The NPRM addresses possible changes to the Commission's Part 90 rules governing the 904-909.75 MHz and 919.75-928 MHz portions of the 902-928 MHz band. Part 90 makes those frequencies available to licensees in the multilateration Location and Monitoring Service ("M-LMS").[2] M-LMS licensees share the 902-928 MHz band with, among others, "numerous unlicensed devices authorized under Part 15 of the Commission's rules."[3] In the NPRM, the Commission seeks comment on:

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[1] *In the Matter of Amendment of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Notice of Proposed Rulemaking, WT Docket No. 06-49, FCC No. 06-24 (rel. March 7, 2006) ("NPRM"). The NPRM was prompted by issues raised in a petition for rulemaking that was filed by Progeny LMS, LLC ("Progeny").

[2] As used in these comments, the term "M-LMS" includes the multilateration location and monitoring service as presently configured and as it might be configured following any rule changes adopted in this proceeding.

[3] NPRM, ¶ 3.

- modifying the limits on permissible M-LMS uses and interconnection;
- revising the power and other technical limits for M-LMS to reduce the possibility of M-LMS stations interfering with Part 15 devices in the event that permissible M-LMS uses are expanded or M-LMS stations are permitted to interconnect;
- eliminating the prohibition against aggregating M-LMS Block A spectrum with M-LMS Block B/Block C spectrum;
- retaining the "safe harbor" under which Part 15 operations in the 902-928 MHz band satisfying specified technical criteria are insulated against M-LMS claims of harmful interference;
- continuing the requirement that M-LMS licensees conduct field tests to ensure that their systems do not cause unacceptable levels of interference to Part 15 devices; and

For the reasons stated herein and in the comments filed by the Part 15 Coalition (the "Coalition"), of which Itron is a member:

- The Commission should not authorize any expansion of permissible M-LMS uses that would expose Part 15 devices to unacceptable levels of interference through increases, in the aggregate, in the power, power spectral density, or duty cycle of M-LMS devices.
    - M-LMS must remain a special purpose service to avoid unacceptable levels of interference.
    - Determining whether any revision of permissible M-LMS uses would expose Part 15 devices to unacceptable levels of interference is possible only in the context of a concrete proposal permitting judgments to be made as to the nature of the permitted use, the locations in which the use is likely to be made, and the duty cycle needed for the use.
    - If no concrete proposal is made during the comment period on the NPRM, then the Commission should promptly conclude this proceeding based on the lack of a record that would warrant changing the permissible uses for the M-LMS.

- If permissible M-LMS uses are revised, it is essential that the Commission modify the technical rules for the service to reduce interference potential. The following measures should be considered:

    - reducing maximum EIRP for M-LMS stations;
    - requiring that high duty cycle functions continue to be performed in the 927.25-928 MHz portion of the M-LMS band; and
    - adopting frequency hopping spread spectrum rules for M-LMS systems (but Itron does not support the adoption of digital modulation rules for M-LMS systems).

- M-LMS spectrum aggregation should not be permitted, because aggregation would present disincentives to efficient use of M-LMS spectrum.

- The safe harbor should be retained. The reasons for having a safe harbor are as valid today as they were when the Commission first adopted a safe harbor.

- The requirements for field tests should be retained.

II. ITRON IS AN INTERESTED PARTY.

Itron manufactures automatic meter reading ("AMR") systems.[4] These systems use fixed and mobile wireless devices to enable a utility to monitor equipment such as business or residential meters from a remote location. Traditionally, utility company employees had to travel to each device and record measurements manually. With AMR technologies, wireless sensors installed in each remote piece of equipment transmit measurements back to a mobile unit (such as a van), to the utility's central office or headquarters, or to an information processing center. The 902-928 MHz band provides a critical link in Itron's AMR systems.

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[4] Wireless meter-reading systems represent a significant advance over conventional methods for providing an interface between utilities and utility meters. They enhance dramatically utility productivity and efficiency, in some cases eliminating the need for time-consuming travel and, in others, making it possible for a meter reader to increase by a factor of ten, twenty, or more the number of meters that can be read in an eight-hour shift.

Itron has provided nearly 40 million meter modules to more than 1200 electric, gas, and water utilities nationwide, and Itron's customers have invested over $2 billion in their AMR networks. Because of its extensive use of the 902-928 MHz band, Itron was an active participant in the original M-LMS proceeding and in the proceeding addressing Progeny's petition for rulemaking.

III. THE COMMISSION SHOULD NOT AUTHORIZE ANY EXPANSION OF PERMISSIBLE M-LMS USES THAT WOULD EXPOSE PART 15 DEVICES TO UNACCEPTABLE LEVELS OF INTERFERENCE.

A. The Commission Has Committed to Protecting Part 15 Devices

The comments filed by the Part 15 Coalition are a testament to the many and varied uses for Part 15 devices operating in the 902-928 MHz band. In addition to current uses, the 902-928 band has served as an incubator for new technologies. Cordless telephone services originated in the band. The band was the source of local area network developments that gave rise to WiFi, Bluetooth, and other wireless technologies that have proliferated in other unlicensed bands. Advances in RFID technology also have been made in the band.

In the NPRM, the Commission made clear the priority it attaches to unlicensed 902-928 MHz devices. It "recognize[d] the importance of maintaining the existing accessibility of the band for unlicensed devices," which it found has "led to a proliferation of important public, private, and consumer applications."[5] It stated that these devices "number in the millions," and are used "for a variety of purposes, including remote meter reading, utility load management, cordless telephones, wireless

[5] NPRM, ¶ 3.

local area networks, and other diverse applications."[6] Given the importance of unlicensed operations in the 902-928 MHz band, the Commission pledged to ensure "continued access for … unlicensed uses that share this band"[7] and vowed to "avoid any significant increase in interference to unlicensed users in this band."[8]

B. M-LMS Must Remain a Limited Purpose Service

These statements continue the commitment to unlicensed operations in the 902-928 MHz band that the Commission made when it established the M-LMS. In adopting M-LMS rules, the Commission "recognize[d] the concerns of the Part 15 and amateur communities that the expansion of the permissible uses of the LMS service will result in more intensive use of the 902-928 MHz band."[9] It also acknowledged that "[u]nfettered interconnection and messaging in the LMS could … increase the potential for harmful interference to other users of the band."[10]

The Commission proceeded carefully to ensure that these interference concerns were taken into account. It required that M-LMS stations be used principally for the limited purpose of vehicle location.[11] It also mandated that M-LMS stations not be used for voice communication, and that they generally not be interconnected on a real time basis with the PSTN. These restrictions meant that M-LMS stations would be used outdoors and could be expected to operate with limited duty cycles and to be deployed

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[6] NPRM, ¶ 5.
[7] NPRM, ¶ 4.
[8] NPRM, ¶ 1.
[9] *Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, Report and Order*, 10 FCC Rcd 4695 (1995) *("First Report and Order")*, at 4708.
[10] *Id*.
[11] *See* 47 C.F.R. § 90.7 (definition of multilateration LMS system); 47 C.F.R. § 90.353(g) (primary operations of M-LMS systems should involve vehicle location services).

in limited numbers. The restrictions have the effect of reducing – albeit not eliminating – the likelihood that a higher powered M-LMS station will be operating on the same frequency as, at the same time as, and in the vicinity of, a Part 15 device.

Eliminating the special-purpose limits on the M-LMS could have serious consequences. As is discussed elsewhere in these comments, even at the reduced power levels as to which the Commission has sought comment, M-LMS stations would operate at thousands of times the power used by many Part 15 devices. If these higher powered M-LMS stations were permitted to transmit for any purpose, at any location, for any length of time, with any number of units, there would be serious interference to Part 15 devices.

C. Interference Evaluations Cannot Be Made in the Abstract

When it comes to interference, context is key. Determining whether any revision of permissible M-LMS uses would expose Part 15 devices to unacceptable levels of interference is possible only in the context of a specific proposal permitting judgments to be made as to the nature of the permitted use, the locations in which the use is likely to be made, the number of units required to support the use, and the duty cycle needed for the use.

It is conceivable there are other limited purpose uses that, if the Commission were to authorize them instead of –not in addition to – the uses presently permitted in the M-LMS, would not increase the possibility of interference to Part 15 devices. It is incumbent on the proponents of changes to the M-LMS rules, however, to identify these uses so that their interference potential can be evaluated properly. Although Progeny

filed its petition for rulemaking over four years ago, to date no such proposal has been forthcoming. If no concrete proposal is made during the comment period on the NPRM, then the Commission should promptly conclude this proceeding based on the lack of a record that would warrant changing the permissible uses for the M-LMS.

IV. IF PERMISSIBLE M-LMS USES ARE EXPANDED, IT IS ESSENTIAL THAT THE COMMISSION MODIFY THE TECHNICAL RULES FOR THE SERVICE.

In the event that a concrete proposal is made to expand permissible M-LMS uses, thereby increasing the possibility of interference to Part 15 operations, the Commission needs to consider what measures could be taken to mitigate M-LMS's interference potential. The following areas are the most promising:

(1) reducing maximum equivalent isotropically radiated power ("EIRP");

(2) requiring that beacon signals and polling continue to be performed in the 927.25-928 MHz portion of the M-LMS band; and

(3) employing frequency hopping (but not digital modulation) techniques.

A. Reducing Maximum EIRP

It is axiomatic that higher EIRP means higher interference potential. To minimize the interference potential of M-LMS stations if permissible M-LMS uses are expanded, therefore, the maximum M-LMS EIRP should be reduced to levels that are as close as possible, consistent with the operational requirements of the expanded uses, to the maximum EIRP levels that may be produced by 902-928 MHz band Part 15 devices, as set forth in Section 15.247 of the Commission's rules.[12]

[12] 47 C.F.R. § 15.247 (establishing rules for spread spectrum and digital modulation devices).

In the NPRM, the Commission sought comment on reducing the maximum EIRP in the three primary M-LMS band segments (904-909.75, 919.75-921.75, and 921.75-927.25 MHz) from 49.2 watts to 10 watts, and reducing the maximum EIRP in the narrowband M-LMS band segment (927.25-928 MHz) from 492 watts to 16.4 watts. The Commission stated that making this change would mean that M-LMS would be able to operate at only 2.5 times the power, instead of 12.3 times the power, of Part 15 devices, in the primary M-LMS band segments.

The "2.5 times the power" figure understates the potential for interference, however, because it is based on an assumption that the Part 15 device is operating with the maximum power permitted under Section 15.247 of the rules. In fact, many Part 15 devices operate well below this power level.

For example, Part 15 devices authorized under Section 15.249 of the rules are subject to tighter power limits than those authorized under Section 15.247. An M-LMS station operating with 10 watts EIRP would have at least 6,000 times – rather than 2.5 times - the maximum power that is available to the Section 15.249 device.[13] This differential would be even more pronounced for Part 15 devices authorized under Section 15.231 of the rules, which are subject to tighter power limits than Section 15.249 devices.

Although any power reduction is a step in the right direction in terms of reducing interference potential, Itron would have to know what changes were being

[13] Section 15.249 establishes 902-928 MHz band field strength limits in uV/m that equate to under 1 mW of effective radiated power ("ERP"). The 10 watt EIRP limit that the Commission has sought comment on for stations in the three primary M-LMS bands is equivalent to 6.1 watts ERP, which is over 6,000 times as powerful as an ERP of 1 mW.

proposed to M-LMS permissible uses before it could speak meaningfully to an appropriate EIRP level. Itron notes, however, that even with the power reduction suggested by the Commission, M-LMS transmitters would operate with power multiple times – in some cases thousands of times - that of Part 15 stations. This disparity in power poses a risk of interference whenever M-LMS transmitters and Part 15 devices are in the same vicinity. Itron estimates that, at the 10 watt EIRP level suggested in the NPRM, an M-LMS station could interfere with a utility's meter-reading operations if the M-LMS station came within 500 feet of a typical AMR device.

B. Beacon Signals and Polling in the Upper Portion of the M-LMS Band

At present, the M-LMS rules permit use of significantly higher power on the narrowband (250 kHz) channels at the top of the M-LMS band, at 927.25-928 MHz, than in the rest of the band. As discussed above, the Commission has sought comment as to whether EIRP limits for M-LMS should be reduced in a manner that would narrow the gap between the EIRP limits for the narrowband M-LMS channels and the EIRP limits for the other M-LMS channels.

Itron is aware that M-LMS systems typically use the narrowband M-LMS channels for beacon signals and polling functions that have high duty cycles. Itron has taken into account in its network architecture the fact that these high duty cycle functions are at the top of the band.

In the event that the Commission institutes comparable power limits for the narrowband M-LMS channels and other M-LMS channels, the operators of M-LMS systems may have a reduced incentive to use their narrowband channels for beacon

signals and polling functions. Relocating those signals and functions to the lower portion of the band, however, would increase the potential for interference, given that Itron - and possibly others - have designed their systems based on the assumption that M-LMS beacon signals and polling functions would be in the upper portion of the band. Accordingly, if the Commission adopts comparable power limits for narrowband and non-narrowband M-LMS channels, it should require that beacon signals, polling functions, and other high duty cycle operations continue to use the narrowband M-LMS channels.

C. Use of Frequency Hopping and Digital Modulation Techniques

The Commission asks in the NPRM "whether to adopt technical rules for M-LMS operations that are similar to the frequency hopping and digital modulation rules set forth in Section 15.247."[14] Devices using these techniques, the Commission notes, can induce less energy into the receivers of other devices and can exhibit greater immunity to interfering signals.[15]

Itron supports the adoption of frequency hopping spread spectrum ("FHSS") rules for M-LMS systems, particularly if combined with reductions in maximum EIRP levels.[16] FHSS systems make for good neighbors because transmission time on each frequency is relatively brief.

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[14] NPRM, ¶ 30.
[15] NPRM, ¶ 30.
[16] The FHSS rules set forth in Section 15.247 establish time of occupancy limits as well as minimum carrier spacing, channel bandwidth, and pseudo-random hopping requirements. Similar requirements would be in order if the Commission were to adopt FHSS rules for M-LMS systems.

If FHSS for M-LMS were implemented, then Emission Mask K would have to be revised. The mask, which applies to M-LMS stations, does not take into account the channel spacing and bandwidth requirements of FHSS spread spectrum systems. Accordingly, the channel spacing and bandwidth requirements that appear in 15.247 of the rules, or something substantially similar, would need to be added to Emission Mask K.

Itron advises against the adoption of digital modulation rules for M-LMS systems. Digitally modulated devices authorized under Section 15.247 generally have higher duty cycles for given channels than FHSS devices authorized under Section 15.247. These higher duty cycle devices potentially present compatibility issues for some part 15 products. Permitting M-LMS systems to operate with digital modulation would exacerbate the compatibility issue

If the Commission were to adopt digital modulation rules for M-LMS systems, however, which Itron believes is ill-advised, at a minimum it should implement a channel bandwidth limitation and an adjustment to Emission Mask K that would allow for "channels," thereby potentially giving other users access to the band. Two possibilities are shown in Attachment A. In addition, if digital modulation rules are adopted, Itron proposes that the Commission apply a duty cycle limit to reduce interference potential.

V. M-LMS SPECTRUM AGGREGATION SHOULD NOT BE PERMITTED.

At present, M-LMS licensees may aggregate M-LMS spectrum in blocks B and C, but may not aggregate Block A spectrum with either of the other blocks.[17] The Commission has sought comment as to whether this policy continues to make sense.[18]

Itron supports retention of the current policy. Keeping M-LMS spectrum from Block A in separate hands from Block B and Block C spectrum provides incentives to use M-LMS spectrum more efficiently. If a single licensee had access to the entire M-LMS band, on the other hand, it would have less reason to look for spectrum conserving measures that would optimize the use of each MHz. To preserve the appropriate incentives, the current policy should remain in force.

VI. THE SAFE HARBOR SHOULD BE RETAINED.

The Commission has "adopted a safe harbor for unlicensed users of Part 15 devices … within which they are legally insulated from M-LMS operators' claims of harmful interference."[19] Notwithstanding objection to the safe harbor raised by Progeny, the Commission tentatively concluded in the NPRM that the safe harbor should be retained.[20] It found that the safe harbor "effectively delineates rights and responsibilities such that the efficient sharing of the band can occur with limited potential for interference."[21]

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[17] NPRM, ¶ 34.
[18] NPRM, ¶ 35.
[19] NPRM, ¶ 36.
[20] NPRM, ¶ 36.
[21] NPRM, ¶ 36.

Itron concurs with the Commission's tentative conclusion. The safe harbor is an integral part of the careful balance that the Commission struck between the needs of M-LMS and Part 15. The safe harbor fosters a more stable, predictable environment for the development of Part 15 devices, thereby encouraging investment in new and improved Part 15 uses. The need for a safe harbor is as strong – or stronger – today as it was when the Commission first adopted it. For all of these reasons, the safe harbor should be retained.

VII. THE M-LMS TESTING REQUIREMENT SHOULD BE RETAINED.

Part 90 of the FCC's rules requires that M-LMS licensees conduct field tests to determine whether their systems will cause unacceptable field tests to Part 15 devices.[22] M-LMS licensees must demonstrate that they have "performed additional testing that would provide data to users of the band and that could contribute to the 'fine-tuning' of system operations and facilitate band sharing."[23]

Progeny has questioned whether the testing requirement can be implemented properly, based on what it perceives as a lack of information concerning Part 15 devices and an absence of adequately-defined engineering standards.[24] The appropriate response to Progeny's concerns, however, is to refine the test procedures, not eliminate them. The testing requirement serves an important function by ensuring that there is an accounting of real world interference issues that may arise in the field but not in a test lab. Accordingly, the testing requirement should be retained.

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[22] *See* 47 C.F.R. § 90.353(d).
[23] NPRM, ¶ 39.
[24] NPRM, ¶ 39.

CONCLUSION

For the reasons stated herein, no changes should be made to the permissible uses for M-LMS unless they are made in the context of a concrete proposal that preserves the limited-purpose nature of M-LMS and does not expose Part 15 devices to unacceptable levels of interference. If permissible uses are expanded, and they should not be, then the Commission should consider reducing M-LMS EIRP limits, requiring that higher duty cycle M-LMS functions be performed in the top part of the 902-928 MHz band, and permitting or requiring the use of frequency hopping spread spectrum techniques (but not digital modulation techniques) for M-LMS. Finally, there is no basis for modifying the M-LMS spectrum aggregation rules, the safe harbor for Part 15 operations, and the M-LMS testing requirements, all of which should be preserved.

Respectfully submitted,

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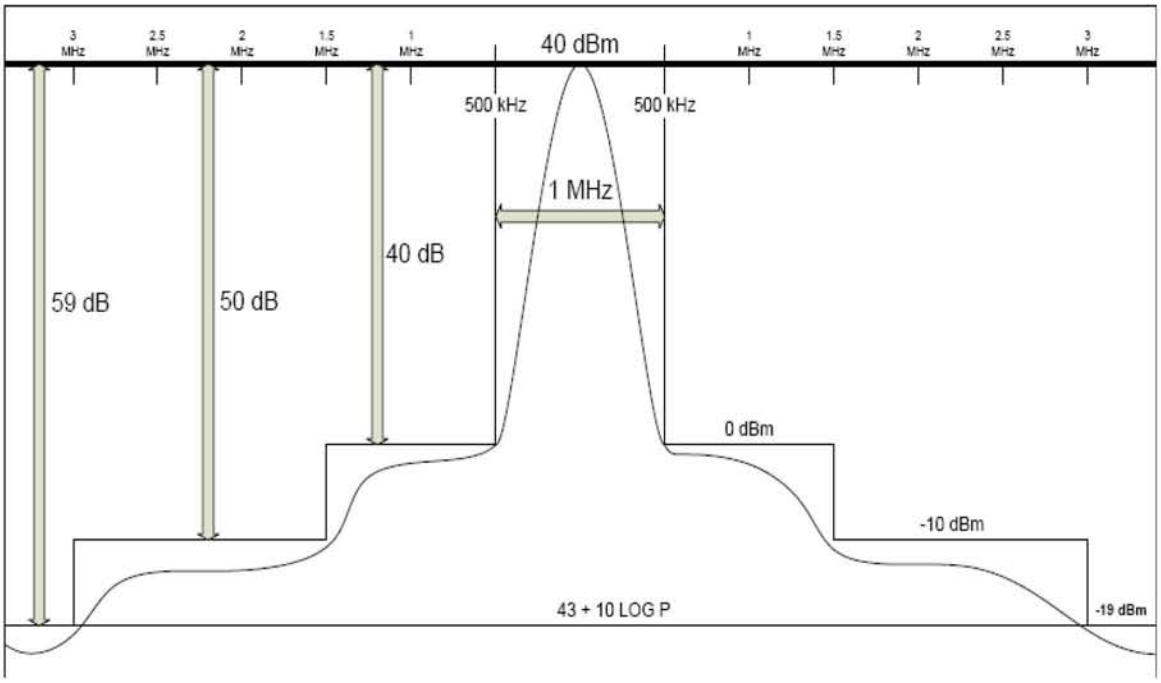
Attachment A

Option 1: A channel bandwidth limitation of 1 MHz and the following adjustment to Emission Mask K.



Option 2: A channel bandwidth limitation of 2 MHz and the following adjustment to Emission Mask K.